

REMARKS

Status of the Claims

Claims 12-27 are pending in the present application. Claims 20-22 and 24 are withdrawn as directed to a non-elected invention. Claims 1-11 were previously canceled. Claim 12 is amended to specify "with fat cells isolated from mammalian fat tissues." Support for this element is found on page 6, line 11, in the specification as originally filed. Claim 27 is new. Support for new claim 27 is found, *e.g.*, in pending claim 12. Accordingly, no new matter is entered by way of this amendment. The claims are amended without prejudice or disclaimer. Entry of the instant amendment, the September 30, 2009, amendment and the Declaration under 37 C.F.R. § 1.132, submitted on September 30, 2009, are respectfully requested. Reconsideration is also respectfully requested.

Issues Under 35 U.S.C. § 103(a)

Claims 12-19, 23, 25, and 26 remain rejected under 35 U.S.C. § 103(a) as allegedly obvious over U.S. 2002/0142457 to Umezawa *et al.* ("Umezawa") in view of Rangappa *et al.*, *Ann. Thorac. Surg.*, 2003, 75:775-779 ("Rangappa"), Egger *et al.*, *Nature*, 2004, Bonnet *et al. Clin. Exp. Med.*, Gilmore *et al. Exp. Hematol.*, 2000, and Lee *et al.*, *Blood*, 2004, for the reasons of record, *see Office Action*, pages 6-12. Applicants respectfully traverse.

In addition to the arguments and Declaration set forth in the September 30, 2009, reply, Applicants submit the following unexpected results. The Examiner indicated in the Final Office Action that an ordinary artisan recognizes that bone marrow cell populations or fat tissue cell populations can give rise to cardiomyocytes, *see Final Office Action*, page 5. However, Rangappa suggest that 5-azacytidine is required for stem cells derived from fat tissue to differentiate into cardiomyocytes. Subsequent to the filing date of the instant application, Applicants reported that cells from fat tissue can spontaneously differentiate into cardiomyocytes without 5-azacytidine. In contrast, bone marrow cells cannot differentiate into cardiomyocytes without any stimuli, *see*: Yamada, Y. *et al.*, *BBRC*, 2006, 342: 662-670, especially, page 663, left column, lines 11-23; and Yamada, Y. *et al.*, *Stem Cells*, 2007, 25: 1326-1333, , for example, page 1329, left column, lines 1-24, each enclosed. Applicants submit that a person of ordinary skill in

the art would not have expected before Applicants' invention that bone marrow cells could have differentiated into cardiomyocytes without chemical stimuli, such as 5-azacytidine. Accordingly, the claimed co-culture method, which does not require 5-azacytidine, is an unexpected result.

Further, new claim 27 is directed to a co-culture method, which consists essentially of the described bone marrow cells or cord blood-derived cells and cells isolated from mammalian fat tissues or a culture supernatant thereof.

Accordingly, the present invention does not encompass chemical stimuli. Applicants submit that the present invention is not obvious in view of the cited references, since inducing the described cells to differentiate into cardiomyocytes without chemical stimuli would have been surprising to an ordinary artisan.

In addition to the above-described surprising results, Applicants further submit that claims 12-19, 23, 25, and 26, as amended, are not rendered obvious by the cited references. None of the cited references, either alone or in combination, teach culturing said bone marrow cells or cord blood-derived cells with fat cells isolated from mammalian fat tissues. Instead Rangappa describe the use of mesenchymal stem cells from fatty tissue, *see* page 776 of Rangappa.

In view of the foregoing, the claims are not obvious in view of the cited references. Withdrawal of the rejection is respectfully requested.

CONCLUSION

In view of the above, Applicants believe that the pending application is in condition for allowance.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact L. Parker, Reg. No. 46,046, at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

By 

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Attachments: Yamada, Y. et al., BBRC 342: 662-670, 2006
Yamada, Y. et al., Stern Cells 25: 1326-1333, 2007